the Great Lakes System in the States of Indiana, Michigan and Ohio.

(d) Effective November 6, 2000, §132.4(d)(2) shall apply to waters designated as "Class D" under section 701.9 of Title 6 of the New York State Codes, Rules and Regulations within the Great Lakes System in the State of New York. For purposes of this paragraph, chronic water quality criteria and values for the protection of aquatic life adopted or developed pursuant to §132.4(a) through (c) are the criteria and values adopted or developed by New York State Department of Environmental Conservation (see section 703.5 of Title 6 of the New York State Codes, Rules and Regulations) and approved by EPA under section 303(c) of the Clean Water Act.

(e) Effective November 6, 2000, the criteria for mercury contained in Table 4 of this part shall apply to waters within the Great Lakes System in the State of New York.

(f) Effective December 6, 2000, the chronic aquatic life criterion for endrin in Table 2 of this part shall apply to the waters of the Great Lakes System in the State of Wisconsin designated by Wisconsin as Warm Water Sportfish and Warm Water Forage Fish aquatic life use.

(g) Effective February 5, 2001, the chronic aquatic life criterion for selenium in Table 2 of this part shall apply to the waters of the Great Lakes System in the State of Wisconsin designated by Wisconsin as Limited Forage Fish aquatic life use.

(h) Effective December 6, 2000, the requirements of procedure 3 in appendix F of this part shall apply for purposes of developing total maximum daily loads in the Great Lakes System in the State of Wisconsin.

(i) Effective December 6, 2000, the requirements of paragraphs D and E of procedure 5 in appendix F of this part shall apply to discharges within the Great Lakes System in the State of Wisconsin.

(j) Effective December 6, 2000, the requirements of paragraph D of procedure 6 in appendix F of this part shall apply to discharges within the Great Lakes System in the State of Wisconsin.

[65 FR 47874, Aug. 4, 2000, as amended at 65 FR 59737, Oct. 6, 2000; 65 FR 66511, Nov. 6, 2000; 76 FR 57652, Sept. 16, 2011]

Tables to Part 132

Table 1—Acute Water Quality Criteria for Protection of Aquatic Life in Ambient Water

EPA recommends that metals criteria be expressed as dissolved concentrations (see appendix A, I.A.4 for more information regarding metals criteria).

(a)

Chemical	CMC (µg/L)	Conversion factor (CF)
Arsenic (III)	[a,b] 339.8	1.000
Chromium (VI)	[a,b] 16.02	0.982
Cyanide	[c] 22	n/a
Dieldrin	[d] 0.24	n/a
Endrin	[d] 0.086	n/a
Lindane	[d] 0.95	n/a
Mercury (II)	[a,b] 1.694	0.85
Parathion	[d] 0.065	n/a

[a] $CMC=CMC^{tr}$.

[b] $CMC^{d}=(CMC^{tr})$ CF. The CMC^{d} shall be rounded to two significant digits.

[c] CMC should be considered free cyanide as CN.

[d] $CMC=CMC^{t}$.

Notes:
The term "n/a" means not applicable.
CMC is Criterion Maximum Concentration.
CMC^{tr} is the CMC expressed as total recoverable.
CMC^{d} is the CMC expressed as a dissolved concentration.
CMC^{t} is the CMC expressed as a total concentration.

(b)

Chemical	m_A	b_A	Conversion factor (CF)
Cadmium [a,b]	1.128	−3.6867	0.85
Chromium (III) [a,b]	0.819	+3.7256	0.316
Copper [a,b]	0.9422	−1.700	0.960
Nickel [a,b]	0.846	+2.255	0.998
Pentachlorophenol [c]	1.005	−4.869	n/a
Zinc [a,b]	0.8473	+0.884	0.978

[a] $CMC^{tr}=\exp\{m_A [\ln(\text{hardness})]+b_A\}$.

[b] $CMC^{d}=(CMC^{tr})$ CF. The CMC^{d} shall be rounded to two significant digits.

[c] $CMC^{t}=\exp m_A \{[pH]+b_A\}$. The CMC^{t} shall be rounded to two significant digits.

Notes:
The term "exp" represents the base e exponential function.
The term "n/a" means not applicable.
CMC is Criterion Maximum Concentration.
CMC^{tr} is the CMC expressed as total recoverable.
CMC^{d} is the CMC expressed as a dissolved concentration.
CMC^{t} is the CMC expressed as a total concentration.

[60 FR 15387, Mar. 23, 1995, as amended at 65 FR 35286, June 2, 2000]

TABLE 2—CHRONIC WATER QUALITY CRITERIA FOR PROTECTION OF AQUATIC LIFE IN AMBIENT WATER

EPA recommends that metals criteria be expressed as dissolved concentrations (see appendix A, I.A.4 for more information regarding metals criteria).

(a)

Chemical	CCC (µg/L)	Conversion factor (CF)
Arsenic (III)	[a,b] 147.9	1.000
Chromium (VI)	[a,b] 10.98	0.962
Cyanide	[c] 5.2	n/a
Dieldrin	[d] 0.056	n/a
Endrin	[d] 0.036	n/a
Mercury (II)	[a,b] 0.9081	0.85
Parathion	[d] 0.013	n/a
Selenium	[a,b] 5	0.922

[a] $CCC=CCC^{tr}$.
[b] $CCC^{d}=(CCC^{tr})$ CF. The CCC^{d} shall be rounded to two significant digits.
[c] CCC should be considered free cyanide as CN.
[d] $CCC=CCC^{t}$.

Notes:
The term "n/a" means not applicable.
CCC is Criterion Continuous Concentration.
CCC^{tr} is the CCC expressed as total recoverable.
CCC^{d} is the CCC expressed as a dissolved concentration.
CCC^{t} is the CCC expressed as a total concentration.

(b)

Chemical	m_c	b_c	Conversion factor (CF)
Cadmium [a,b]	0.7852	−2.715	0.850
Chromium (III) [a,b]	0.819	+0.6848	0.860
Copper [a,b]	0.8545	−1.702	0.960
Nickel [a,b]	0.846	+0.0584	0.997
Pentachlorophenol [c]	1.005	−5.134	n/a
Zinc [a,b]	0.8473	+0.884	0.986

[a] $CCC^{tr}=\exp\{m_c[\ln(\text{hardness})]+b_c\}$.
[b] $CCC_d=(CCC^{tr})$ (CF). The CCC^{d} shall be rounded to two significant digits.
[c] $CMC^{t}=\exp\{m_A[\text{pH}]+b_A\}$. The CMC^{t} shall be rounded to two significant digits.

Notes:
The term "exp" represents the base e exponential function.
The term "n/a" means not applicable.
CCC is Criterion Continuous Concentration.
CCC^{tr} is the CCC expressed as total recoverable.
CCC^{d} is the CCC expressed as a dissolved concentration.
CCC^{t} is the CCC expressed as a total concentration.

TABLE 3—WATER QUALITY CRITERIA FOR PROTECTION OF HUMAN HEALTH

Chemical	HNV (µg/L)		HCV (µg/L)	
	Drinking	Non-drinking	Drinking	Non-drinking
Benzene	1.9E1	5.1E2	1.2E1	3.1E2
Chlordane	1.4E–3	1.4E–3	2.5E–4	2.5E–4
Chlorobenzene	4.7E2	3.2E3		
Cyanides	6.0E2	4.8E4		
DDT	2.0E–3	2.0E–3	1.5E–4	1.5E–4
Dieldrin	4.1E–4	4.1E–4	6.5E–6	6.5E–6
2,4-Dimethylphenol	4.5E2	8.7E3		
2,4-Dinitrophenol	5.5E1	2.8E3		
Hexachlorobenzene	4.6E–2	4.6E–2	4.5E–4	4.5E–4
Hexachloroethane	6.0	7.6	5.3	6.7
Lindane	4.7E–1	5.0E–1		
Mercury [1]	1.8E–3	1.8E–3		
Methylene chloride	1.6E3	9.0E4	4.7E1	2.6E3
2,3,7,8-TCDD	6.7E–8	6.7E–8	8.6E–9	8.6E–9
Toluene	5.6E3	5.1E4		
Toxaphene			6.8E–5	6.8E–5
Trichloroethylene			2.9E1	3.7E2

[1] Includes methylmercury.

[60 FR 15387, Mar. 23, 1995, as amended at 62 FR 11731, Mar. 12, 1997; 62 FR 52924, Oct. 9, 1997]

TABLE 4—WATER QUALITY CRITERIA FOR PROTECTION OF WILDLIFE

Chemical	Criteria (µg/L)
DDT and metabolites	1.1E–5
Mercury (including methylmercury)	1.3E–3
PCBs (class)	1.2E–4
2,3,7,8-TCDD	3.1E–9

[60 FR 15387, Mar. 23, 1995, as amended at 62 FR 11731, Mar. 12, 1997]

TABLE 5—POLLUTANTS SUBJECT TO FEDERAL, STATE, AND TRIBAL REQUIREMENTS

Alkalinity
Ammonia
Bacteria
Biochemical oxygen demand (BOD)
Chlorine
Color
Dissolved oxygen
Dissolved solids
pH
Phosphorus
Salinity
Temperature
Total and suspended solids
Turbidity

TABLE 6—POLLUTANTS OF INITIAL FOCUS IN THE GREAT LAKES WATER QUALITY INITIATIVE

A. Pollutants that are bioaccumulative chemicals of concern (BCCs):
Chlordane
4,4′-DDD; p,p′-DDD; 4,4′-TDE; p,p′-TDE
4,4′-DDE; p,p′-DDE
4,4′-DDT; p,p′-DDT
Dieldrin
Hexachlorobenzene
Hexachlorobutadiene; hexachloro-1, 3-butadiene
Hexachlorocyclohexanes; BHCs
alpha-Hexachlorocyclohexane; alpha-BHC

beta-Hexachlorocyclohexane; beta-BHC
delta-Hexachlorocyclohexane; delta-BHC
Lindane; gamma-hexachlorocyclohexane; gamma-BHC
Mercury
Mirex
Octachlorostyrene
PCBs; polychlorinated biphenyls
Pentachlorobenzene
Photomirex
2,3,7,8-TCDD; dioxin
1,2,3,4-Tetrachlorobenzene
1,2,4,5-Tetrachlorobenzene Toxaphene

B. Pollutants that are not bioaccumulative chemicals of concern:

Acenaphthene
Acenaphthylene
Acrolein; 2-propenal
Acrylonitrile
Aldrin
Aluminum
Anthracene
Antimony
Arsenic
Asbestos
1,2-Benzanthracene; benz[a]anthracene
Benzene
Benzidine
Benzo[a]pyrene; 3,4-benzopyrene
3,4-Benzofluoranthene; benzo[b]fluoranthene
11,12-Benzofluoranthene; benzo[k]fluoranthene
1,12-Benzoperylene; benzo[ghi]perylene
Beryllium
Bis(2-chloroethoxy) methane
Bis(2-chloroethyl) ether
Bis(2-chloroisopropyl) ether
Bromoform; tribomomethane
4-Bromophenyl phenyl ether
Butyl benzyl phthalate
Cadmium
Carbon tetrachloride; tetrachloromethane
Chlorobenzene
p-Chloro-m-cresol; 4-chloro-3-methylphenol
Chlorodibromomethane
Chlorethane
2-Chloroethyl vinyl ether
Chloroform; trichloromethane
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chlorpyrifos
Chromium
Chrysene
Copper
Cyanide
2,4-D; 2,4-Dichlorophenoxyacetic acid
DEHP; di(2-ethylhexyl) phthalate
Diazinon
1,2:5,6-Dibenzanthracene; dibenz[a,h]anthracene
Dibutyl phthalate; di-n-butyl phthalate
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3′-Dichlorobenzidine
Dichlorobromomethane; bromodichloromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene; vinylidene chloride
1,2-trans-Dichloroethylene
2,4-Dichlorophenol
1,2-Dichloropropane
1,3-Dichloropropene; 1,3-dichloropropylene
Diethyl phthalate
2,4-Dimethylphenol; 2,4-xylenol
Dimethyl phthalate
4,6-Dinitro-o-cresol; 2-methyl-4,6-dinitrophenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Dioctyl phthalate; di-n-octyl phthalate
1,2-Diphenylhydrazine
Endosulfan; thiodan
alpha-Endosulfan
beta-Endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethylbenzene
Fluoranthene
Fluorene; 9H-fluorene
Fluoride
Guthion
Heptachlor
Heptachlor epoxide
Hexachlorocyclopentadiene
Hexachloroethane
Indeno[1,2,3-cd]pyrene; 2,3-o-phenylene pyrene
Isophorone
Lead
Malathion
Methoxychlor
Methyl bromide; bromomethane
Methyl chloride; chloromethane
Methylene chloride; dichloromethane
Napthalene
Nickel
Nitrobenzene
2-Nitrophenol
4-Nitrophenol
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodipropylamine; N-nitrosodi-n-propylamine
Parathion
Pentachlorophenol
Phenanthrene
Phenol
Iron
Pyrene
Selenium
Silver
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
Thallium
Toluene; methylbenzene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane

Trichloroethylene; trichloroethene
2,4,6-Trichlorophenol
Vinyl chloride; chloroethylene; chloroethene
Zinc

APPENDIX A TO PART 132—GREAT LAKES WATER QUALITY INITIATIVE METHODOLOGIES FOR DEVELOPMENT OF AQUATIC LIFE CRITERIA AND VALUES

METHODOLOGY FOR DERIVING AQUATIC LIFE CRITERIA: TIER I

Great Lakes States and Tribes shall adopt provisions consistent with (as protective as) this appendix.

I. Definitions

A. *Material of Concern*. When defining the material of concern the following should be considered:

1. Each separate chemical that does not ionize substantially in most natural bodies of water should usually be considered a separate material, except possibly for structurally similar organic compounds that only exist in large quantities as commercial mixtures of the various compounds and apparently have similar biological, chemical, physical, and toxicological properties.

2. For chemicals that ionize substantially in most natural bodies of water (e.g., some phenols and organic acids, some salts of phenols and organic acids, and most inorganic salts and coordination complexes of metals and metalloid), all forms that would be in chemical equilibrium should usually be considered one material. Each different oxidation state of a metal and each different nonionizable covalently bonded organometallic compound should usually be considered a separate material.

3. The definition of the material of concern should include an operational analytical component. Identification of a material simply as ''sodium,'' for example, implies ''total sodium,'' but leaves room for doubt. If ''total'' is meant, it must be explicitly stated. Even ''total'' has different operational definitions, some of which do not necessarily measure ''all that is there'' in all samples. Thus, it is also necessary to reference or describe the analytical method that is intended. The selection of the operational analytical component should take into account the analytical and environmental chemistry of the material and various practical considerations, such as labor and equipment requirements, and whether the method would require measurement in the field or would allow measurement after samples are transported to a laboratory.

a. The primary requirements of the operational analytical component are that it be appropriate for use on samples of receiving water, that it be compatible with the available toxicity and bioaccumulation data without making extrapolations that are too hypothetical, and that it rarely result in underprotection or overprotection of aquatic organisms and their uses. Toxicity is the property of a material, or combination of materials, to adversely affect organisms.

b. Because an ideal analytical measurement will rarely be available, an appropriate compromise measurement will usually have to be used. This compromise measurement must fit with the general approach that if an ambient concentration is lower than the criterion, unacceptable effects will probably not occur, i.e., the compromise measure must not err on the side of underprotection when measurements are made on a surface water. What is an appropriate measurement in one situation might not be appropriate for another. For example, because the chemical and physical properties of an effluent are usually quite different from those of the receiving water, an analytical method that is appropriate for analyzing an effluent might not be appropriate for expressing a criterion, and vice versa. A criterion should be based on an appropriate analytical measurement, but the criterion is not rendered useless if an ideal measurement either is not available or is not feasible.

NOTE: The analytical chemistry of the material might have to be taken into account when defining the material or when judging the acceptability of some toxicity tests, but a criterion must not be based on the sensitivity of an analytical method. When aquatic organisms are more sensitive than routine analytical methods, the proper solution is to develop better analytical methods.

4. It is now the policy of EPA that the use of dissolved metal to set and measure compliance with water quality standards is the recommended approach, because dissolved metal more closely approximates the bioavailable fraction of metal in the water column that does total recoverable metal. One reason is that a primary mechanism for water column toxicity is adsorption at the gill surface which requires metals to be in the dissolved form. Reasons for the consideration of total recoverable metals criteria include risk management considerations not covered by evaluation of water column toxicity. A risk manager may consider sediments and food chain effects and may decide to take a conservative approach for metals, considering that metals are very persistent chemicals. This approach could include the use of total recoverable metal in water quality standards. A range of different risk management decisions can be justified. EPA recommends that State water quality standards be based on dissolved metal. EPA will also approve a State risk management decision